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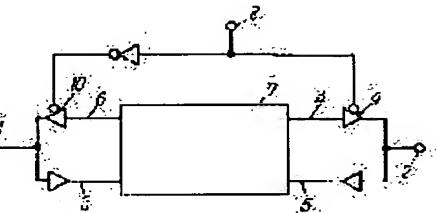
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(54) CIRCUIT DEVICE FOR DRIVING LIQUID CRYSTAL

(57)Abstract:

PURPOSE: To reduce difficulty at mounting by providing a Tri-state I/O buffer.

CONSTITUTION: This device is provided with the Tri-state I/O buffers 9, 10 switching two pieces of input/output transmission signal terminals 3, 4 for right shift and two pieces of the input/output transmission signal terminals 5, 6 for left shift according to a shift direction switch control terminal 8. Thus, the number of terminals of shift transmission signal input/output terminals in a circuit for driving a liquid crystal are reduced to two pieces of a shift transmission signal input terminal, a shift transmission signal output terminal 1, 2, and a wiring pitch at the time of mounting a pannel is widened.



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CLAIMS

[Claim(s)]

[Claim 1] In the circuit apparatus for liquid crystal actuation of the liquid crystal display which has a transfer signal input terminal for right shifts, and a transfer signal output terminal for left shifts at the end, and has a transfer signal input terminal for left shifts, and a transfer signal output terminal for right shifts in the other end The 1st input/output terminal connected to said transfer signal output terminal for left shifts, and said transfer signal input terminal for right shifts, The 2nd input/output terminal connected to said transfer signal output terminal for right shifts, and said transfer signal input terminal for left shifts. It has the shift direction change control terminal connected to said transfer signal output terminal for right shifts, and said transfer signal output terminal for left shifts (6). The 1st Tri-state An I/O buffer Said 1st input/output terminal, It connects with said transfer signal output terminal for left shifts, and said shift direction change control terminal, and is the 2nd Tri-state. Circuit apparatus for liquid crystal actuation by which the I/O buffer was connected to said 2nd input/output terminal, said transfer signal output terminal for right shifts, and said shift direction change control terminal.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to a liquid crystal display, especially the circuit apparatus for liquid crystal actuation.

[0002]

[Description of the Prior Art] In recent years, bearing an important role of a man machine interface in the information society growing rapidly, it progresses technically and quickly and a liquid crystal display panel is also expanding the application goods field greatly.

[0003] The conventional liquid crystal display is explained below. Drawing 2 is the block diagram having shown only the shift transfer signal terminal in the circuit section for liquid crystal actuation of the

conventional liquid crystal display, and drawing 3 is a block diagram at the time of mounting the circuit section for liquid crystal actuation in a liquid crystal panel. In drawing 2, for the transfer signal input terminal for right shifts, and 4, as for the transfer signal input terminal for left shifts, and 6, the transfer signal output terminal for right shifts and 5 are [3 / the transfer signal output terminal for left shifts and 7] ICs for liquid crystal actuation, and, for 11, as for a panel upper edge part and 13, IC for liquid crystal actuation and 12 are [a panel lower edge part and 14] liquid crystal panels in drawing 3.

[0004] About the liquid crystal display constituted as mentioned above, the actuation is explained below. As shown in drawing 3, it is necessary to arrange to the upper edge part 12 and lower edge part 13 of the top of the panel of mounting, and the shift register circuit in the interior of the circuit section 7 for liquid crystal actuation of drawing 2 is changed to a right shift or a left shift by to which it arranges in arrangement of IC11 (it is henceforth called Y driver) for liquid crystal actuation which manages level actuation of the liquid crystal panel of 14. As the terminal of the present circuit section for liquid crystal actuation is shown in drawing 2 however, a sake [in the case of said right shift] It has two, the transfer signal input terminal 3 for right shifts, and the transfer signal output terminal 4 for right shifts. Further a sake [in the case of said left shift] It had two, the transfer signal input terminal 5 for left shifts, and the transfer signal output terminal 6 for left shifts, and the liquid crystal display was performed with the shift transfer input of a total of four, or the output terminal.

[0005]

[Problem(s) to be Solved by the Invention] However, with the above-mentioned conventional configuration, there were many terminals of a shift transfer I/O signal, and since the wiring pitch at the time of panel mounting became narrow, mounting had the fault of being difficult.

[0006] This invention solves the above-mentioned conventional trouble, can extend the wiring pitch at the time of panel mounting by reducing the number of terminals of the shift transfer I/O signal of the circuit for liquid crystal actuation from four to two, and aims at offering the liquid crystal display which can mitigate whenever [at the time of mounting / difficult].

[0007]

[Means for Solving the Problem] In order to attain this object, the circuit apparatus for liquid crystal actuation of this invention follows the shift direction change control terminal, and they are an I/O transfer signal for right shifts, and an I/O transfer signal for left shifts Tri-state It has the configuration which is changed and is controlled by the I/O buffer.

[0008]

[Function] A shift transfer signal terminal can be reduced to two by carrying out selection immobilization of said one of shift directions for that in which the terminal of a total of four shift transfer signals of two I/O transfer signals for right shifts and two I/O transfer signals for left shifts existed by this configuration according to the shift direction change control terminal.

[0009]

[Example] One example of this invention is explained below, referring to a drawing.

[0010] Drawing 1 shows the block diagram of the liquid crystal display in the 1st example of this invention. In drawing 1 the shift transfer signal I/O terminal A and 2 1 The shift transfer signal I/O terminal B The transfer signal input terminal for right shifts and 4 3 The transfer signal output terminal for right shifts, For the transfer signal output terminal for left shifts, and 7, as for the shift direction change control terminal and 9, the circuit section for liquid crystal actuation and 8 are [5 / the transfer signal input terminal for left shifts, and 6 / an R control Tri-state buffer and 10] L control Tri-state buffers.

[0011] About the liquid crystal display constituted as mentioned above, the actuation is explained below. when Y driver is located in the upper edge part (12 of drawing 3) of a liquid crystal panel, in order [first,] to perform a right shift -- always -- the shift direction change control terminal 8 -- 'LOW' -- giving -- the gate of the R control Tri-state buffer 9 -- open -- the gate of he and the L control Tri-state buffer 10 is changed into the condition of having been closed. After spreading the signal inputted

from the shift transfer signal I/O terminal A1 to the transfer signal input terminal 3 for right shifts through a buffer and being further shifted inside the liquid crystal actuation circuit section 7. The outputted shift signal with which it spreads from the transfer signal output terminal 4 for right shifts, and this signal passes the R control Tri-state buffer 9, and is outputted from shift transfer signal I/O terminal B-2 is repeated further to the following Y driver.

[0012] Next, when Y driver is located in the lower edge part (13 of drawing 3) of a liquid crystal panel In order to perform a left shift, 'HIGH' is always given to the shift direction change control terminal 8. The gate of the L control Tri-state buffer 10 is opened, and change the gate of the R control Tri-state buffer 9 into the condition of having been closed. After spreading the signal inputted from shift transfer signal I/O terminal B-2 to the transfer signal input terminal 5 for left shifts through a buffer and being further shifted inside the liquid crystal actuation circuit section 7. The outputted shift signal with which it spreads from the transfer signal output terminal 6 for left shifts, and this signal passes the L control Tri-state buffer 10, and is outputted from the shift transfer signal I/O terminal A1 is repeated further to the following Y driver. Thus, the level line of a display is scanned sequentially.

[0013] Tri-state which changes two I/O transfer signal terminals for right shifts, and two I/O transfer signal terminals for left shifts according to the shift direction change control as mentioned above according to this example By preparing an I/O buffer, the thing required four shift transfer signal input/output terminals can be realized by two, the wiring pitch at the time of panel mounting can be extended by having reduced the number of terminals, and whenever [at the time of mounting / difficult] can be mitigated.

[0014]

[Effect of the Invention] This invention is Tri-state which changes two I/O transfer signal terminals for right shifts, and two I/O transfer signal terminals for left shifts according to the shift direction change control terminal as mentioned above. By preparing an I/O buffer The wiring pitch at the time of panel mounting can be extended by having reduced the number of terminals for the thing required four shift transfer signal input/output terminals to two, and the outstanding liquid crystal display which can mitigate whenever [at the time of mounting / difficult] can be realized.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

Drawing 1 The block diagram of the circuit for liquid crystal actuation of the liquid crystal display in one example of this invention

Drawing 2 The block diagram having shown only the shift transfer signal terminal in the conventional circuit section for liquid crystal actuation

Drawing 3 The block diagram at the time of mounting IC for liquid crystal actuation in a liquid crystal

panel

[Description of Notations]

- 1 Shift Transfer Signal I/O Terminal A
 - 2 Shift Transfer Signal I/O Terminal B
 - 3 Transfer Signal Input Terminal for Right Shifts
 - 4 Transfer Signal Output Terminal for Right Shifts
 - 5 Transfer Signal Input Terminal for Left Shifts
 - 6 Transfer Signal Output Terminal for Left Shifts
 - 7 Circuit Section for Liquid Crystal Actuation
 - 8 The Shift Direction Change Control Terminal
 - 9 R Control Tri-state Buffer
 - 10 L Control Tri-state Buffer
 - 11 IC for Liquid Crystal Actuation
 - 12 Panel Upper Edge Part
 - 13 Panel Lower Edge Part
 - 14 TFT-Liquid-Crystal Panel
-

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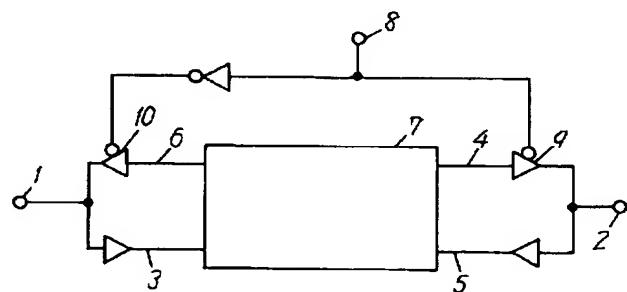
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(54)【発明の名称】 液晶駆動用回路装置

(57)【要約】

【目的】 実装時の困難度を軽減する。

【構成】 右シフト用の入出力伝達信号端子3, 4の2本と左シフト用の入出力伝達信号端子5, 6の2本をシフト方向切替え制御端子8に従って切り替えるTri-state I/Oバッファ9, 10を設けることにより、液晶駆動用回路のシフト伝達信号入出力端子をシフト伝達信号入力端子とシフト伝達信号出力端子の2本に端子数を減らすことができ、パネル実装時の配線ピッチが広げられた。



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【特許請求の範囲】

【請求項 1】一端に右シフト用伝達信号入力端子及び左シフト用伝達信号出力端子を有し、他端に左シフト用伝達信号入力端子及び右シフト用伝達信号出力端子を有する液晶表示装置の液晶駆動用回路装置において、前記左シフト用伝達信号出力端子と前記右シフト用伝達信号入力端子に接続された第1の入出力端子、前記右シフト用伝達信号出力端子と前記左シフト用伝達信号入力端子に接続された第2の入出力端子、前記右シフト用伝達信号出力端子と前記左シフト用伝達信号出力端子(6)に接続されたシフト方向切替制御端子とを備え、第1のTri-state I/Oバッファが前記第1の入出力端子、前記左シフト用伝達信号出力端子及び前記シフト方向切替制御端子に接続され、第2のTri-state I/Oバッファが前記第2の入出力端子、前記右シフト用伝達信号出力端子及び前記シフト方向切替制御端子に接続された液晶駆動用回路装置。

【発明の詳細な説明】

【0001】

【産業上の利用分野】本発明は、液晶表示装置、特に液晶駆動用回路装置に関するものである。

【0002】

【従来の技術】近年、液晶表示パネルは急成長する情報化社会におけるマンマシンインターフェースとしての重要な役割を担いつつ、技術的にも急速に進歩し、またその応用商品分野も大きく拡大しつつある。

【0003】以下に従来の液晶表示装置について説明する。図2は従来の液晶表示の液晶駆動用回路部におけるシフト伝達信号端子のみを示した構成図であり、図3は液晶パネルに液晶駆動用回路部を実装した場合の構成図である。図2において、3は右シフト用伝達信号入力端子、4は右シフト用伝達信号出力端子、5は左シフト用伝達信号入力端子、6は左シフト用伝達信号出力端子、7は液晶駆動用ICであり、図3において、11は液晶駆動用IC、12はパネル上辺部、13はパネル下辺部、14は液晶パネルである。

【0004】以上のように構成された液晶表示装置について、以下その動作を説明する。図3に示すように、14の液晶パネルの水平駆動をつかさどる液晶駆動用IC11(以後Yドライバーという)の配置において、実装上パネルの上辺部12と下辺部13に配置する必要があり、どちらに配置するかによって、図2の液晶駆動用回路部7の内部にあるシフトレジスタ回路を、右シフトまたは左シフトに切替える。しかしながら現在の液晶駆動用回路部の端子は図2に示す通り、前記右シフトの場合のために、右シフト用伝達信号入力端子3と右シフト用伝達信号出力端子4の2本を持ち、さらに前記左シフトの場合のために、左シフト用伝達信号入力端子5と左シフト用伝達信号出力端子6の2本を持ち、計4本のシフト伝達入力または出力端子をもって液晶表示を行ってい

た。

【0005】

【発明が解決しようとする課題】しかしながら上記従来の構成では、シフト伝達入出力信号の端子数が多く、パネル実装時の配線ピッチが狭くなるため実装が困難であるという欠点を有していた。

【0006】本発明は、上記従来の問題点を解決するもので、液晶駆動用回路のシフト伝達入出力信号の端子数を4本から2本に減らすこと、パネル実装時の配線ピッチを広げることができ、実装時の困難度を軽減できる液晶表示装置を提供することを目的とする。

【0007】

【課題を解決するための手段】この目的を達成するために本発明の液晶駆動用回路装置は、シフト方向切替え制御端子に従い右シフト用の入出力伝達信号と左シフト用の入出力伝達信号をTri-state I/Oバッファで切替え制御する構成を有している。

【0008】

【作用】この構成によって、右シフト用の入出力伝達信号2本と左シフト用の入出力伝達信号2本の計4本のシフト伝達信号の端子が存在していたものをシフト方向切替え制御端子に従い、前記いずれかのシフト方向を選択固定することで、シフト伝達信号端子を2本に減らすことができる。

【0009】

【実施例】以下本発明の一実施例について、図面を参照しながら説明する。

【0010】図1は本発明の第1の実施例における液晶表示装置の構成図を示すものである。図1において、1はシフト伝達信号I/O端子A、2はシフト伝達信号I/O端子B、3は右シフト用伝達信号入力端子、4は右シフト用伝達信号出力端子、5は左シフト用伝達信号入力端子、6は左シフト用伝達信号出力端子、7は液晶駆動用回路部、8はシフト方向切替え制御端子、9はR制御Tri-stateバッファ、10はL制御Tri-stateバッファである。

【0011】以上のように構成された液晶表示装置について、以下その動作を説明する。まず、Yドライバーが液晶パネルの上辺部(図3の12)に位置した場合、右シフトを行うため、常にシフト方向切替え制御端子8に‘LOW’を与え、R制御Tri-stateバッファ9のゲートが開かれ、L制御Tri-stateバッファ10のゲートは閉じられた状態にする。シフト伝達信号I/O端子A1から入力された信号はバッファを介して右シフト用伝達信号入力端子3に伝搬し、液晶駆動回路部7の内部にてさらにシフトされた後で、右シフト用伝達信号出力端子4から伝搬し、この信号が、R制御Tri-stateバッファ9を通過してシフト伝達信号I/O端子B2より出力される、出力されたシフト信号はさらに次のYドライバーへと繰り返されていく。

(3)

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【0012】次に、Yドライバーが液晶パネルの下辺部(図3の13)に位置した場合は、左シフトを行うため常にシフト方向切替え制御端子8に‘HIGH’を与え、L制御Tri-stateバッファ10のゲートが開かれ、R制御Tri-stateバッファ9のゲートは閉じられた状態にする。シフト伝達信号I/O端子B2から入力された信号はバッファを介して左シフト用伝達信号入力端子5に伝搬し、液晶駆動回路部7の内部にてさらにシフトされた後で、左シフト用伝達信号出力端子6から伝搬し、この信号が、L制御Tri-stateバッファ10を通過してシフト伝達信号I/O端子A1より出力される。出力されたシフト信号はさらに次のYドライバーへと繰り返されていく。このようにして表示の水平ラインが順次走査されていく。

【0013】以上のように本実施例によれば、右シフト用の入出力伝達信号端子2本と左シフト用の入出力伝達信号端子2本をシフト方向切替え制御に従って切り替えるTri-state I/Oバッファを設けることにより、シフト伝達信号入出力端子4本必要であったものを2本で実現でき、端子数を減らしたことでパネル実装時の配線ピッチを広げることができ、実装時の困難度を軽減できるものである。

【0014】

【発明の効果】以上のように本発明は、右シフト用の入出力伝達信号端子2本と左シフト用の入出力伝達信号端子2本をシフト方向切替え制御端子に従って切り替えるTri-state I/Oバッファを設けることにより、シフト

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伝達信号入出力端子4本必要であったものを2本に端子数を減らしたことでパネル実装時の配線ピッチを広げることができ、実装時の困難度を軽減できる優れた液晶表示装置を実現できるものである。

【図面の簡単な説明】

【図1】本発明の一実施例における液晶表示装置の液晶駆動用回路の構成図

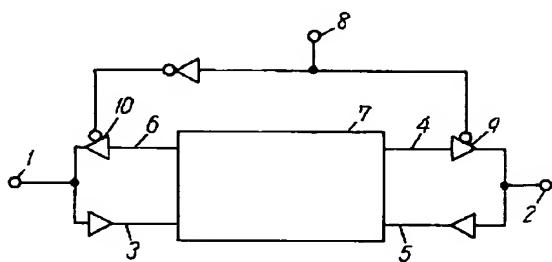
【図2】従来の液晶駆動用回路部におけるシフト伝達信号端子のみを示した構成図

【図3】液晶パネルに液晶駆動用ICを実装した場合の構成図

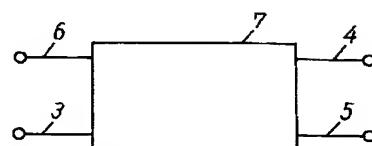
【符号の説明】

- 1 シフト伝達信号I/O端子A
- 2 シフト伝達信号I/O端子B
- 3 右シフト用伝達信号入力端子
- 4 右シフト用伝達信号出力端子
- 5 左シフト用伝達信号入力端子
- 6 左シフト用伝達信号出力端子
- 7 液晶駆動用回路部
- 8 シフト方向切替え制御端子
- 9 R制御Tri-stateバッファ
- 10 L制御Tri-stateバッファ
- 11 液晶駆動用IC
- 12 パネル上辺部
- 13 パネル下辺部
- 14 TFT液晶パネル

【図1】



【図2】



(4)

【図3】

